

CHRYSO MEL I D A E ; WITH A NOTE ON THE COMPARATIVE ANATOMY OF SOME HALTICINE TIBIAE

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(With 18 Text-figures.)

THE following beetles of the Family Chrysomelidae occur in the Samoan Islands :

Subfamily CRYPTOCEPHALINAE.	1. <i>Aprionota lucida</i> , gen. et sp. nov.
	2. <i>Pycnophthalma tutuilana</i> , gen. et sp. nov.
„ EUMOLPINAE . .	3. <i>Stygnobia aenescens</i> , sp. nov.
	4. „ <i>cauta</i> Weise
	5. „ <i>variabilis</i> , sp. nov.
	6. „ <i>minuta</i> , sp. nov.
	7. <i>Rhyparida subaeneicollis</i> Fairmaire.
	8. <i>Stethotes rufonigra</i> , sp. nov.
„ CHRYSOMELINAE .	9. <i>Plagiodera samoana</i> , sp. nov.
„ GALERUCINAE .	10. <i>Aulacophora similis</i> Olivier.
	11. „ <i>quadrinaculata</i> F.
	12. „ <i>nigrobrunnea</i> , sp. nov.
	13. <i>Plesistia brunnea</i> , gen. et sp. nov.
„ HALTICINAE . .	14. <i>Nesohaltica nigra</i> , gen. et sp. nov.
	15. <i>Sphaerophyma insularum</i> , sp. nov.
„ HISPINAE . .	16. <i>Promecotheca reichei</i> Baly.
„ CASSIDINAE . .	17. <i>Cassida strigula</i> Montrouzier.

Remarks about variation, geographical distribution, morphology and other interesting points have been made in the body of the paper, but can be summarised as follows :

(1) The species that are apparently indigenous and confined to these islands have Australasian affinities.

(2) Some species of wider distribution also occur in these islands.

(3) Some species have evidently been introduced with agricultural commodities.

(4) A general idea concerning variation in island faunas is formulated on p. 191.

(5) Of the sixteen subfamilies of Chrysomelidae, seven are represented in the collections dealt with in the present paper.

(6) The seventeen species here recorded include representatives of four new genera, eleven new and six previously described species.

(7) One species (*Promecothea reichei* Baly) has been recorded as a pest of the coconut palm, though it was rare in 1924, 1925.

I wish to record my sincere thanks to Messrs. W. H. T. Tams and K. G. Blair of the British Museum (Natural History), Mr. G. E. Bryant of the Imperial Bureau of Entomology, Dr. Walther Horn of Berlin, Dr. Franz Heikertinger of Vienna, and Dr. J. B. Corporaal of Amsterdam, for assistance in my study. In addition, I am much indebted to Mr. A. J. E. Terzi, who has made the drawings for the text-figures.

CRYPTOCEPHALINAE.

Aprionota, gen. nov.

Body ovate, not hairy above. *Head* deeply imbedded in the prothorax. Antennae fairly long, extending nearly to the middle of the body, eleven-segmented, six apical segments thickened but not formed into a club. Eyes emarginate near the roots of the antennae. *Prothorax* with the base not margined, and with the median portion produced into an acute lobe; the basal edge without serrations. *Scutellum* small, visible from above, not hidden by the median lobe of the prothorax and not sloping. *Elytra* punctate-striate. *Under side*: intercoxal process of prosternum almost quadrate, broad, with the surface rough and the sides margined; front coxal cavities rounded. Bilobed segment of the tarsi small, claw segment projecting a little beyond the bilobed segment; claws appendiculate.

Relationship.—In the form of the body and general facies the genotype of the present new genus resembles *Ditropidus* and the allied genera; and these include a considerable number of species belonging to the Australian region. The present genus differs from *Ditropidus* in not possessing an antennal club, and in not having serrations on the posterior edge of the pronotum. On the other hand the species now to be described cannot find a place in the genus *Cryptocephalus*, because the former has the median portion of the pronotum produced into a lobe and the scutellum small, though not hidden from view by the median lobe, and not in a sloping position.

Genotype: *Aprionota lucida* Maulik.

Range: Samoa.

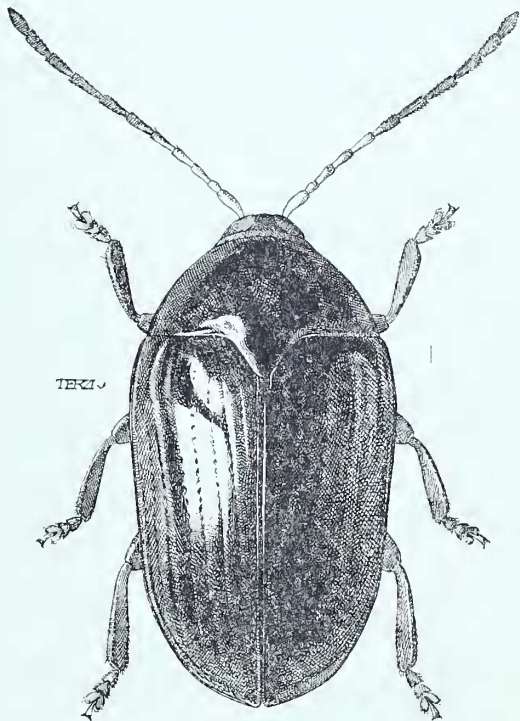
1. *Aprionota lucida*, sp. nov. (Text-fig. 1).

Body narrowed in front and more so posteriorly. General colour shining black, sometimes slightly diluted with dark red-brown; five basal segments of antennae brown, tinged with blackish; legs similarly coloured, in some cases brown predominating, in others blackish colour more evident.

Head with impunctate vertex. Eyes approximated, separated by a thin strip. First segment of antennae long and club-shaped, second small rounded, third and fourth equal, each being shorter than fifth, sixth thicker and longer than fifth, seventh to tenth about equal to each other, eleventh somewhat smaller, ovate and blunt. *Prothorax* narrowed in front, with somewhat convex margin; sloping at each side; lateral edge margined; upper surface smooth, almost impunctate, or seen under a high power very sparsely punctate. *Scutellum* small, ovate, flat, smooth and impunctate. *Elytra* not broader at base than prothorax. Humerus not convex nor prominent. On each elytron eleven longitudinal regular rows of punctures, including a scutellar and an extreme marginal row; intervals between rows appearing raised on lateral and apical areas, and the rows themselves appearing deeply imbedded in channels; rows meeting in pairs on apical area, and, at least those on discal area, not parallel to suture but inclined to it at an acute angle; surface of intervals smooth and impunctate. *Under side*: sparsely hairy, abdominal sternites more hairy; female with a deep fossa in middle of penultimate visible sternite.

Length, ♀♀ $2\frac{1}{2}$ mm.; ♂♂ 2 mm.

Upolu: Malololelei, 2,000 ft., vi.1924, 4 examples; 22.xi.1924 (type), 4 examples, one of which is mounted in balsam.



TEXT-FIG. 1.—*Aprionota lucida*, sp. n. $\times 24$.

Tutuila : 760-900 ft., iv.1918 (Kellers), 1 ♀ example.

Type in British Museum.

Described from nine examples.

Pycnophthalma, gen. nov.

Body ovate. *Eyes* large, touching each other on upper side of head. Near the root of each antenna a certain area is without the facets of the eye, so that there is a deep emargination. *Antennae* eleven-segmented, extending almost to middle of body, the six apical segments thickened but not formed into a club. *Prothorax* narrowed in front; base not margined, edge with serrations, part opposite scutellum produced into a lobe which ends in an acute point; sides margined; anterior and posterior angles rounded. *Scutellum* visible from above, narrow, oblong with rounded apex and base fitting against point of prothoracic lobe. *Elytra* not broader at base than prothorax, punctate-striate, longitudinal series of punctures being deeply imbedded in channels. The striae appear, at least on discal area, to be inclined to the suture, *i.e.* they are not parallel to it. Viewed from above, pygidium not exposed. *Under side*: intercoxal process of prosternum almost quadrate or slightly longer than broad, with surface rough and coarsely pitted, sides margined, and posterior edge widely arched. Epipleurae of elytra broader at base and narrowed from middle to apex. Legs fairly stout, not long, so that when withdrawn they are not visible from above; claw segments of tarsi projecting a little beyond bilobed segment; claws appendiculate.

Genotype: *Pycnophthalma tutuilana* Maulik.

Range: Samoa.

Relationship.—In the form of the body and the character of the eyes *Pycnophthalma* resembles the genus *Caenobius*, which was erected by Suffrian in 1857 for an African insect. Since then, owing to the eye character, many species found in Australia, New Guinea, the Fiji Is., Japan, the Philippine Is., the Malay Peninsula, India, and Africa have been included in *Caenobius*.

The species do not seem to form a homogeneous group, and some of them, particularly the African genotype, differ in many respects from the type species of the present new genus. In all probability several species, especially such as occur in the Australian Region, will find a more suitable place in *Pycnophthalma*.

2. *Pycnophthalma tutuilana*, sp. nov. (Text-fig. 2).

Body small. Upper side greenish, under side shining pitch-black, legs and antennae yellow-brown, six apical segments of antennae fuscous.

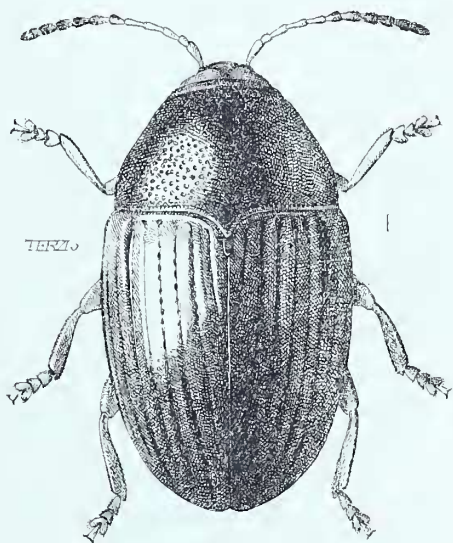
Head deeply imbedded in prothorax, vertex invisible from above. Eyes very large, occupying greater portion of head. Clypeus slightly convex, punctate, each puncture bearing a little hair. First segment of antennae long, thickened and club-shaped; second small, rounded; third, fourth, and fifth segments slender and about equal to each other in length; sixth and seventh equal; eighth to eleventh segments equal to each other, the last blunt, not pointed; six apical segments more hairy. *Prothorax*: front edge together with front edge of prosternum forming a complete circle surrounding head; anteriorly and laterally a deep fossa; upper surface closely punctate; punctures on discal area appearing somewhat elongate and, although without any definite arrangement, tending to converge towards apex; on lateral area punctures are coarser and coalesce with each other. *Scutellum* smooth, impunctate and appearing imbedded in thickened elytral margin. *Elytra*: anterior margin thickened; each elytron with ten longitudinal rows of punctures placed in deeply excavated channels; counting from suture and including scutellar row, the sixth row, which is internal to humerus, is very deeply excavated; intervals between rows raised, fairly broad, very minutely punctate and bearing very fine hairs; the rows of punctures meet in pairs on apical area. *Under side*: metasternum with median longitudinal impression. Anterior and middle coxal cavities rounded. Abdominal sternites finely and closely punctate, bearing very fine scattered whitish hairs. Other structures as stated under generic diagnosis.

Length, 2 mm.

Tutuila: Pago Pago, 10.ix.1923 (Swezey and Wilder), type.

Type in the Bishop Museum, Honolulu.

Described from one example.



TEXT-FIG. 2.—*Pycnophthalma tutuilana*,
sp. n. $\times 30$.

EUMOLPINAE.

Stygnobia Weise.

Stygnobia Weise, *Archiv für Naturgesch.* lxxxviii, Abt. A., Heft 10, pp. 154, 155, 1922.

This genus was founded by Weise for three specimens collected in Upolu, in March, 1913, by Dr. K. Friederichs. Two of these were described as representing one species, and the third as belonging to another. Through the courtesy of Dr. Walther Horn, of Berlin, I have been able to make an examination of these types, as a result of which, and in view of the fact that I have before me a large number of individuals of four species of this genus, a modification of the generic concept is necessary. I therefore redescribe the genus as follows :

Body oblong, ovate, somewhat convex, completely covered with hairs, although on the under side the hairs are very fine and sparse. Antennae eleven-segmented, the fourth segment being the longest. *Prothorax* broader than long, somewhat narrowed in front, sides marginate. *Elytra* confusedly punctate. *Under side* : prosternum narrowed between coxae. Anterior margin of prothoracic episternum subconcave. Legs long, slender ; middle and hind tibiae emarginate at apex ; claws divided into two branches, the inner smaller than the outer.

Genotype : *Stygnobia cauta* Weise.

Range : Apparently confined to the Samoan Islands.

3. *Stygnobia aenescens*, sp. nov. (Text-fig. 3).

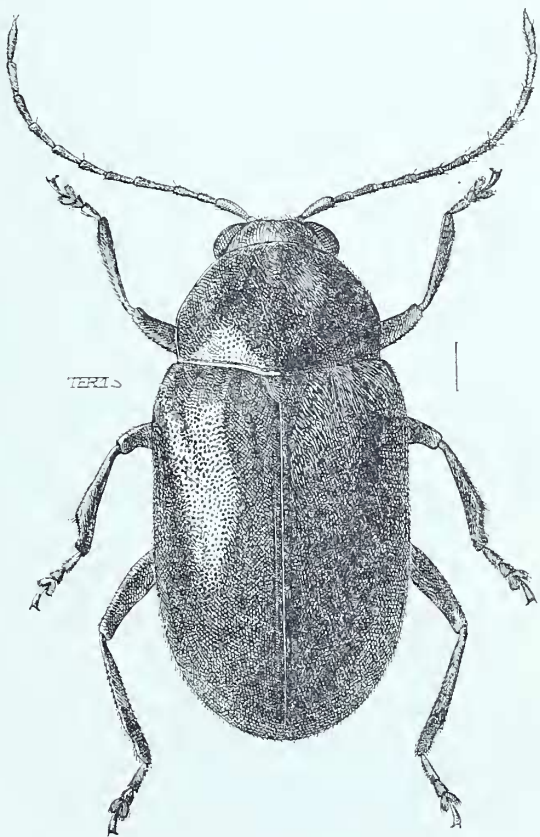
Body subnitid, oblong, ovate, broadest at base of elytra and very slightly narrowing towards apex ; general colour very dark pitch brown, almost black, with bronzy reflections. Pronotum often darker than elytra ; legs lighter brown, femora and tibiae at their bases and apices with dark rings, varying in intensity and extent. Colour of under side identical with that of upper side, either extending uniformly over entire surface, or darker in some parts than in others.

Head somewhat exserted, with apex convex and frons slightly depressed : upper surface very roughly sculptured, the interantennal and interocular spaces closely covered with deep punctures, which, coalescing on the apical area, form channels alternating with ridges. Eyes convex and entire. Antennae extending to about middle of elytra ; first segment long and thickened, second

very small and also thickened, third slender, about twice as long as second, fourth slender, longest, twice as long as third; fifth to eleventh segments about equal to each other in length. *Prothorax* broader than long, somewhat narrowed in front, lateral margins almost straight or very slightly rounded, posterior margin with a feeble median lobe; upper surface uneven, with shallow depressions and elevations, gently sloping on each side in front, very roughly sculptured, covered with coarse and large punctures, which, coalescing, form channels and ridges. *Scutellum* subpentagonal, longer than broad, broader at base, narrowing at apex, which is rounded; surface strongly punctate. *Elytra* very slightly broader at base than prothorax, confusedly, closely and strongly punctate; surface uneven, humerus strongly elevated, with area posterior to it depressed; on inner side of it there is also a depression containing a ridge. Around and behind scutellum a certain area is depressed. A well-marked depression in middle of each elytron behind basal area; among ridges produced by these depressions on the surface, especially prominent are a costa parallel to suture, and a rather large elevation in middle area. (These depressions and prominences are best seen when the insect is held at various angles.) *Under side* not so hairy as upper side; abdominal sternites punctate. First segment of posterior tarsi longer than corresponding segment of anterior or middle tarsi.

Length, 5–6 mm.

Tutuila: Eastern end of island, 1,070 ft., 21.v.1918, 1 example (Kellers). Avau, 19.iii.1926, 1 example. Amouli, 17.iii.1926, 1 example (Judd). Fagasa, 9.ix.1923. 4 examples (Swezey and Wilder). Pago Pago, 12–16.iv.1924,



TEXT-FIG. 3.—*Stygnobia aenescens*, sp. n. ×11.

3 examples (Bryan); 24, 25, 30.ix.1923, 10 examples (Swezey and Wilder) (Type, 25.ix.1928).

Type in the Bishop Museum; *paratype* in the British Museum.

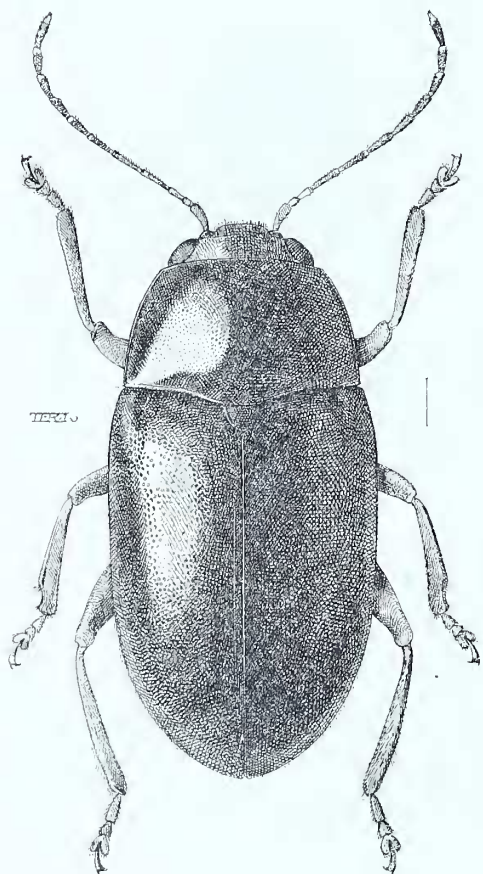
Described from twenty examples. It seems evident that the species is confined to Tutuila.

4. *Stygnobia cauta* Weise (Text-fig. 4).

Stygnobia cauta Weise, *Archiv für Naturgesch.*, lxxxviii, Abt. A., Heft. 10, pp. 154, 1922.

Stygnobia annulipes Weise, *loc. cit.*

Body oblong-ovate. General colour varying from shining dark red-brown



to lighter brown; central area of front of head with a blackish patch, which is sometimes obsolescent; antennal segments in most cases tinged with fuscous; pronotum may be darker (almost pitch-black) than elytra; on under side abdominal sternites may be lighter than rest of surface, distribution of lighter and darker shades varying considerably; legs often lighter brown; in many cases at constriction near apex of femora and at two places on tibiae there are dark brown rings encircling the limbs; these rings may be faint or disappear altogether, and may not be seen on all the legs at once, being well-marked on some while obsolescent or absent on others. In some examples before me there is a black broad longitudinal stripe along the elytra; this stripe is also very variable, appearing as a strongly developed mark in some examples but becoming very faint in others; on the basal area the stripe is bifurcate; when strongly de-

TEXT-FIG. 4.—*Stygnobia cauta* Weise. × 12.

veloped it is broad, covering a considerable portion of the elytral surface. In some examples the elytral punctures are black.

Head with vertex not very convex, and with a depression on central area ; completely punctate, punctures on vertex smaller than those on interocular and interantennal areas, where they coalesce to form a certain rugosity. Area bounded by roots of antennae, central depression and labrum, more or less delimited. Antennae reaching about middle of elytra, first segment thick, club-shaped, long, but shorter than fourth, second very small, third about twice as long as second, fourth about twice as long as third, fifth somewhat shorter than fourth, sixth to eleventh segments about equal to each other. *Prothorax* much broader than long, sides almost straight, slightly converging towards front, sharing general contour of prothorax ; upper surface convex in centre, sloping to sides and more so to front, fairly closely punctate, punctures being round and having no tendency at all to become elongate or to coalesce with one another ; posterior lateral angles right angles ; each corner furnished with a fine long seta. *Scutellum* almost as broad as long, subpentagonal, with apex rounded, surface closely punctate. *Elytra* slightly broader at base than prothorax, sides almost parallel, somewhat narrowing towards apex ; surface closely punctate. On the basal area on the inner side of the humerus there is a depression, on the inner side of which is another depression ; these depressions are black, in many examples, owing to a continuation of the black elytral stripe referred to in the short diagnosis above.

Length, 4–6½ mm. Type example, 6½ mm. Cotype, 5½ mm.

Type and cotype of *S. cauta* Wse. in the Deutsches Entomologisches Museum.

Type of *S. annulipes* Wse. in the same Museum.

Upolu : Aleipata, iv.1924, 5 examples ; v.1924, 1 example. Lalomanu, xi.1924, 1 example. Apia, 4 and 10.iii.1924, 2 examples (Armstrong) ; iii.1924, 9 examples ; iv. 1924 and 1925, 2 examples ; v.1924, 3 examples, and v.1925, 3 examples ; x.1924, 1 example ; xii.1924, 3 examples ; ii.1925, 1 example. Malololelei, 2,000 ft., ii.1924, 1 example ; iv.1924, 2 examples ; vi.1924, 4 examples. Leulumoega, 14.ix.1923, 9 examples (Swezey and Wilder). Muli-fanua, 16.vii.1925, 1 example (Wilder).

Manua : Tau, 27.ix.1923, 1 example (Swezey and Wilder).

Savaii : Fagamalo, xi.1925, 6 examples.

Tutuila : 1,100–1,200 ft., iv.1918, 1 example (Kellers). Pago Pago, 20.ix.1923, 2 examples (Swezey and Wilder) ; 16.iv.1924, 2 examples (Bryan). Leone Rd., 7.ix.1923, 2 examples (Swezey and Wilder).

There are sixty-two specimens of this species in the present collection, and, together with the four, including the types, sent by Dr. Walther Horn, I have examined sixty-six examples.

In view of the small amount of variation shown by so much material, I cannot help coming to the conclusion that *S. annulipes* Wse. should be considered as a variety of *S. cauta* Wse.; thus the former name becomes a synonym of the latter.

Variation.—The variation in size is considerable. It will be noticed that there is a difference of 1 mm. in length between Weise's type and cotype, and there are examples before me which are as small as 4 mm. There is a corresponding apparent variation in shape in which the body is slightly narrowed towards the apex. If a single small example is captured and compared with the type there will be considerable doubt as to whether it belongs to the same species.

The variation in colour and markings have already been indicated in the short colour diagnosis above. There is more structural variation in the sculpturing of the head than elsewhere. The confluence of punctures in the interantennal area, producing a rugosity, is variable.

5. *Stygnobia variabilis*, sp. nov. (Text-fig. 5).

Body ovate. General colour shining dark brown; in uniformly dark brown examples, pronotum and thoracic sterna often darker than rest of body. The colour varieties are as follows: vertex of head may have a longitudinal stripe, broad at base, narrowing towards mouth-parts. Elytra in many examples with a broad stripe along suture, covering a considerable area on each side, and about middle sending off an arm on each side, which encircles a convex area at base (in some examples this encircling process is incomplete); on apical area sutural stripe broadening considerably, covering in an ill-defined manner a large area on each elytron. In some examples the sutural stripe ends abruptly about the middle, but the black colour on the apical area is nevertheless present, and continuing forwards forms a longitudinal stripe. In the specimens with the elytral markings the pronotum may be completely black, or may have certain areas at the sides brown and the rest black, while the lateral edges of the elytra are often black. Among the patterned specimens, the tibiae diffusedly and the hind femora at the point of articulation are often black. Some examples

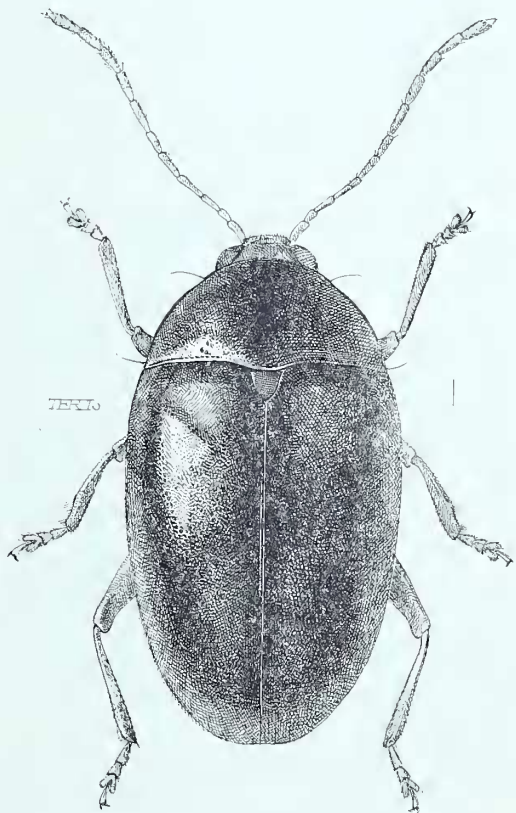
are completely black, except that the mouth-parts, antennae and tarsi remain brownish fuscous.

Head with vertex convex ; front divided by a transverse impressed line or constriction above roots of antennae ; surface strongly and closely punctate, punctures in some cases being confluent with one another and producing ridges ; edge along upper border of eyes deeply impressed. Eyes strongly convex.

Antennae extending slightly beyond middle of elytra ; first segment long and club-shaped, second small, thickened, third slender, about twice as long as second, fourth always longer than third, although relative lengths of third and fourth segments vary to a certain extent ; fifth and following segments about equal, apical segments apparently very slightly thickened.

Prothorax broader than long, somewhat narrowed in front, posterior lateral angles acute, each of the four corners with a fine seta, upper surface convex in centre and sloping on each side, more so in front ; sculpturing varying considerably ; entire surface closely covered with punctures, which are somewhat elongate and in many specimens coalesce, producing oblique longitudinal ridges ; this ridged condition may be very pronounced, or may be altogether wanting ; between

these two limits various gradations may be seen. (The variation in the surface structure of the prothorax renders the identification of a single example, in the absence of a series, very difficult.) *Scutellum* almost pentagonal, fairly broad though longer than broad, apex rounded ; surface closely punctate. *Elytra* as broad at base as prothorax, with a fairly large area at base gently convex (better seen when insect is held at certain angles) ; entire surface closely and confusedly punctate. *Under side* as in generic diagnosis.



TEXT-FIG. 5.—*Stygnobia variabilis*, sp. n. $\times 18$.

Length, 3–3½ mm.

Upolu : Malololelei, 2,000 ft., 24.ii.1924, 11 examples ; 12.iii.1924, 13 examples (including the type) ; iv.1924, 1 example ; 25.iv.1924, 3 examples ; 18.iv.1925, 15 examples ; vi.1924, 23 examples ; 14–30.vi.1924, 11 examples ; 5.i.1924, 1 example ; 20.vi.1924, 1 example ; 2.vii.1924, 1 example (Armstrong) ; vii.1925, 4 examples (Wilder) ; 23.xi.1924, 19 examples ; 28.xi.1924, 1 example. Aleipata, iv. 1924, 1 example. Leulumoega, 14.ix.1923, 2 examples (Swezey and Wilder). Vailima, 600 ft., 2.i.1925, 1 example ; 18.x.1924, 3 examples. Apia, iii.1924, 1 example ; v.1924, 4 examples ; Mt. Vaea, 1,500 ft., 20.xii.1924, 1 example ; 13.ix.1923, 1 example ; 15.ix.1923, 2 examples (Swezey and Wilder). Total : 120 examples from Upolu.

Tutuila : 760–900 ft., iv.1918, 31 examples ; 21.vi.1918, eastern end of island, 1,070 ft., 2 examples ; 30.vi.1918, centre of island, 900–1,000 ft., 3 examples ; 21.vii.1918, 1,000 ft., 10 examples ; 25.viii.1918, 1,000 ft., 5 examples ; xii.1918, 1,200 ft., 1 example (all examples under the various dates were collected by H. C. Kellers). Pago Pago, 2.xii.1924, 4 examples ; 14.xii.1924, 2 examples ; 9.ix.1923, 1 example ; 10.ix.1923, 5 examples ; 30.ix.1923, 5 examples (Swezey and Wilder) ; 12.vi.1924, 1 example ; 16.iv.1924, 2 examples ; 18.iv.1924, 1 example (Bryan). Fagasa, 9.ix.1923, 4 examples (Swezey and Wilder) ; one of the labels bears the words “nutmeg tree.” Total : 77 examples from Tutuila.

Savaii : Fagamalo, xi.1925, 1 example. Salailua, 20.v.1924, 1 example ; 23.v.1924, 5 examples (Bryan). Safune, rain forest, 2,000–4,000 ft., 8.v.1924, 3 examples ; lower forest, 1,000–2,000 ft., 5.v.1924, 1 example (Bryan). Total : 11 examples from Savaii.

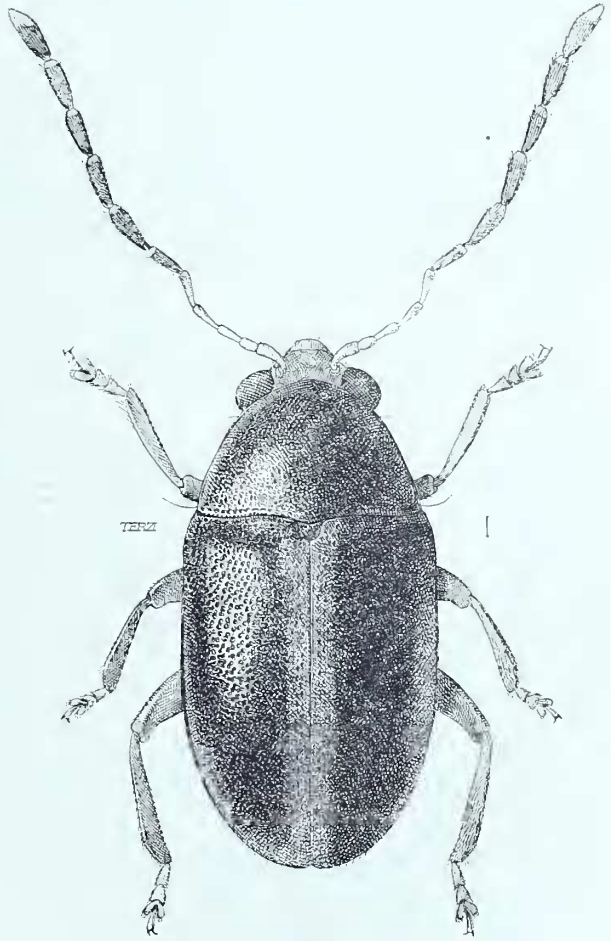
In describing this species I have examined two hundred and eight examples, from two of which three balsam mounts have been made.

Type in the British Museum ; *paratypes* in the Bishop Museum.

6. *Stygnobia minuta*, sp. nov. (Text-fig. 6).

Body oblong-ovate. General colour dark brown, legs lighter brown ; pronotum in some cases black, and elytra with a broad black stripe covering almost entire surface except margins and suture. (In some examples the black colour of the pronotum and elytra has almost disappeared.) Antennal segments blackish, except basal three, which are lighter brown.

Head with vertex convex, uniformly and strongly punctate without any marked depression or impressed lines. Antennae extending to apical area of elytra ; first segment long and club-shaped ; second thick, about one-half as long as first ; third slender and longer than second ; fourth longer than third ; following segments about equal to each other in length, and slightly and gradually increasing in thickness. *Prothorax* broader than long, narrowed in front ; posterior angles rounded, not acute ; upper surface convex in centre, sloping down at sides and more so in front, strongly and closely punctate, punctures coalescing. *Elytra* as broad at base as prothorax ; sides parallel to a certain extent, which gives the insect a broad, squarish appearance as compared to *S. variabilis* ; a certain area at the base on the inner side of the humerus slightly convex ; confusedly and strongly punctate, the punctures closer together and larger than those of *S. variabilis*. *Under side* as in the generic diagnosis.



TEXT-FIG. 6.—*Stygnobia minuta*, sp. n. $\times 26$.

Length, from a little over 2 mm. to $2\frac{1}{2}$ mm.

Upolu : Malololelei, 2,000 ft., iv.1924, 7 examples ; 22.xi.1924, 2 examples, one of which is the type.

Tutuila : Pago Pago, 16.iv.1924, 1 example (Bryan).

Type in the British Museum ; *paratype* in the Bishop Museum.

Described from ten examples.

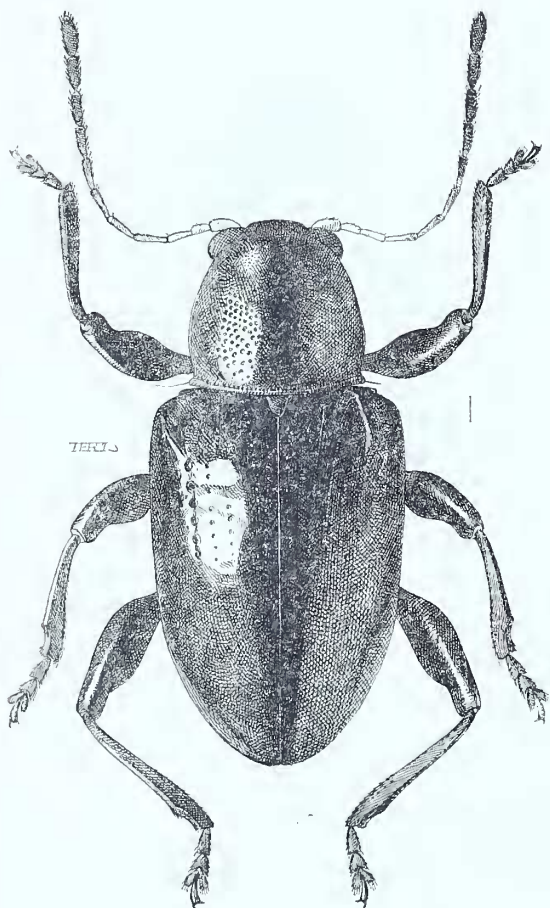
7. *Rhyparida subaeneicollis* Fairmaire.

Rhyparida subaeneicollis Fairm. *Le Naturaliste*, i, p. 76, 1879 ; *Ann. Soc. Ent. Fr.* (6), i, p. 484, 1881.

This species is not represented in the collections under study. It is apparently confined to Samoa, and has not been reported from any other locality.

8. *Stethotes rufonigra*, sp. nov. (Text-fig. 7).

Body ovate, much narrowed posteriorly. General colour black, with an ill-defined area on apical half of elytra red ; antennae piceous, three proximal segments yellow-brown ; palpi similarly coloured.



TEXT-FIG. 7.—*Stethotes rufonigra*, sp. n. $\times 22$.

Head : vertex convex with a median channel, on each side of which are fine oblique ridges producing a strigose appearance. Interocular space somewhat depressed and with a few punctures. Eyes convex ; between each eye and convexity of vertex of head a deep sulcus. Antennae extending a little beyond middle of elytra, first segment thickened and club-shaped, second shorter and thinner than first but thicker than third, fourth longer than third, fifth equal to fourth, sixth somewhat shorter than fifth, seventh, and following segments somewhat thicker, seventh segment slightly longer than eighth, eighth, ninth, and tenth segments equal, eleventh segment ovate, blunt at apex. *Prothorax* narrowed in front and convex, its sides sloping and margined ; basal margin with

a deep channel ; upper surface completely covered with round punctures ; posterior lateral angles each with a fine seta. Under a high power the

background is seen to be finely shagreened. *Scutellum* triangular, with rounded apex, slightly convex, finely shagreened. *Elytra* regularly punctate-striate, much broader at base than prothorax; at base on inner side of humerus is a convex area; on each elytron are thirteen rows of punctures, including a scutellar and an extreme marginal row; counting from suture, ninth and tenth rows arise from behind, and twelfth row arises from below humerus, all being very short; rows meeting in pairs on narrowed apical area. *Under side*: legs of usual length in this genus; femora thickened in middle and without any spine; middle and hind tibiae emarginate on outer side at apex; claws strong, bifid.

Length, 3 mm.

Savaii: Safune, rain forest, 2,000–4,000 ft., 3.v.1924 (Bryan).

Type in the Bishop Museum.

Described from one example.

The study of the Eumolpinae of the present collection lends support to an idea which suggested itself to me when I was studying other island faunas, such as that of the Seychelles. In that case also I was confronted with the same difficulty of judging the limits of a species which showed structural variations. The idea may be formulated thus: *in island faunas species tend to become more plastic than in continental faunas*. I put forward this principle tentatively, and its validity or otherwise will be proved as more experience is accumulated. Mr. K. G. Blair tells me that he observed the same phenomenon in a Lycid beetle, *Samoaneros acuticollis* Fairmaire (Part 4, p. 101 above). Dr. G. A. K. Marshall also tells me that amongst the Samoan Curculionidae the same feature is noticeable in some species. It would be premature to speculate here as to the causes of such variation in island faunas.

CHRYSOMELINAE.

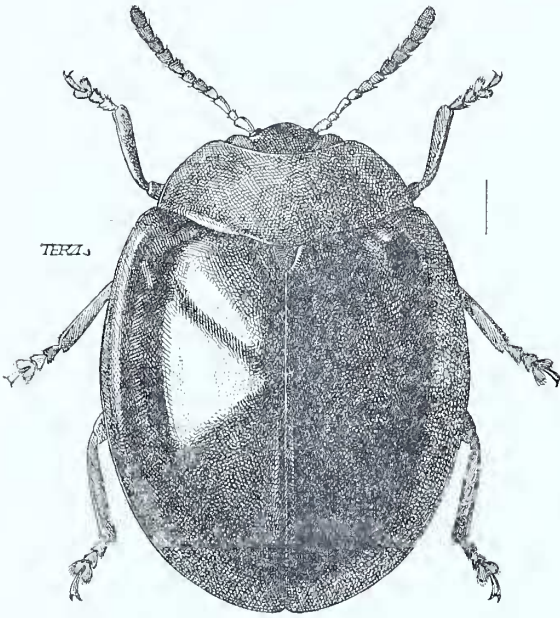
9. *Plagioderma samoana*, sp. nov. (Text-fig. 8).

Body ovate, strongly convex, highest point of convexity being middle of elytra; seen in profile, from this point upper surface slopes down more abruptly in front than behind. General colour shining dark brown; in some cases under side is tinged with blackish, in others it is pitch-black; head and pronotum always brown; elytra pitch-black. Among nine examples before me, in one the pitchy colour is lighter and in two it has become brown, except the apical area of the

elytra. The scutellum always shares the colour of the basal area of the elytra. The four basal segments of antennae are brown, the rest black. The legs are always lighter brown.

Head broad, its width sufficient to allow it to fit into emargination of front edge of pronotum; upper surface deeply marked with a Λ -shaped impression, and also bearing very fine and irregularly placed punctures, some of which are somewhat elongate. Eyes strongly convex. Antennae extending slightly beyond humerus, their roots separated by whole width of frons; first segment largest, thick, club-shaped, second small, also somewhat club-shaped, third

longer than second, fourth shorter than third; fifth and following segments thickened, more opaque than basal segments, about equal, although fifth appears to be somewhat smaller and last segment is bluntly pointed. *Prothorax* more than twice as broad as long, its front margin widely emarginate, narrower than posterior margin, sides oblique, very gently rounded, anterior and posterior lateral angles being rounded right angles; upper surface smooth, very sparsely and extremely minutely punctate, punctures only visible under a high power. *Scutellum* large, triangular, with apex rounded and sur-



TEXT-FIG. 8.—*Plagiodera samoana*, sp. n. $\times 9$.

face smooth, impunctate. *Elytra* strongly convex, narrower at base, broadening behind, again narrowed towards apex; humerus sharply raised; surface smooth, very sparsely and extremely minutely punctate, punctures only visible under a high power. *Under side* smooth, shining, hardly punctate. Legs stout; claw segment of tarsi projecting much beyond bilobed segment, which is split along middle; claws simple.

Length, $6\frac{1}{2}$ mm.; *breadth*, $5\frac{1}{4}$ mm.

Upolu: Malololei, 2,000 ft., 18.iv.1925, 6 examples (including the type); 28.xi.1924, 2 examples.

Tutuila : 1,100–1,200 ft., iv.1918, 1 example (Kellers) ; in this example the brown has an admixture of red in it, and the elytral punctures are somewhat bolder.

Type in the British Museum.

Described from nine examples.

GALERUCINAE.

Aulacophora Chevrolat.

Aulacophora Chevrolat in d'Orbigny, *Dict. Univ. Hist. Nat.*, ii, p. 337, 1842.

Orthaulaca Weise, *Deutsch. Ent. Zeitschr.*, Jahrg., 1892, p. 393, 1892.

The genotype of *Aulacophora* Chevrolat is *Galeruca quadraria* Olivier. In 1892, Weise (*loc. cit.*, p. 392) suggested that the name *Aulacophora* should lapse on the ground that it is preoccupied by a genus of plants ; this contention, however, is not in accordance with the rules of zoological nomenclature. Had the suggestion remained buried in the pages of the *Deutsch. Ent. Zeitschr.* it would not have mattered much, but its author has given effect to it by altering the whole arrangement of the species of this large genus in his Catalogue of the Galerucinae in Junk and Schenkling's *Coleopterorum Catalogus* (Berlin, 1924), thus necessitating a further rearrangement, which I shall attempt in a future publication. For the purposes of the present paper I include the three following species in *Aulacophora*, thus giving it recognition as a genus which cannot be abolished.

10. *Aulacophora similis* Olivier.

There are three secondary sexual characters by which the males of this species can be recognised, namely :

(1) The first segment of the antennae is very greatly enlarged, more so than the same segment in the females.

(2) A certain area behind the humerus is covered with erect hairs.

(3) The apical segments of the abdomen are modified ; on the ventral side the last visible sclerite is trilobed, the middle lobe having on each side a deep incision, which has a fold at its base.

Upolu : Apia, 19.ii.1923, 1 ♀ (Armstrong) ; v.1924, 2 ♂♂, 1 ♀ ; ix.1924, 9 ♀♀, 4 ♂♂, 1 ♂ dissected and mounted in balsam ; 15.x.1924, 1 ♂ ; xii.1924,

1 ♂, 2 ♀♀: v.1925, 1 ♀. Aleipata, 10.iv.1924, 1 ♀; iv.-v.1924, 4 ♀♀. Lalomanu, xi.1924, 2 ♀♀.

Tutuila: 1,000-1,200 ft., 2 ♂♂, 2 ♀♀ (Kellers). Amauli, 5.ix.1923, 1 ♀ (Swezey and Wilder). Afono Trail, 25.ix.1923, 1 ♀, 1 ♂ (Swezey and Wilder). Leone Road, 7.ix.1923, 1 ♀, 1 ♂; 18.ix.1923, 1 ♂ (Swezey and Wilder); 19.ii.1924, 1 ♂, 1 ♀ (Bryan); 12.viii.1925, 1 ♀. Pago Pago, 18.iv.1924, 1 ♀ (Bryan); 20.ix.1923, 1 ♀; 22.ix.1923, 5 ♀♀, 2 ♂♂, all caught on pumpkin (Swezey and Wilder).

Savaii: Lower forest, 1,000-2,000 ft., Safune, 5-8.v.1924, 2 ♀♀, 2 ♂♂; 4.v.1924, 1 ♂; 12.v.1924, 2 ♂♂.

Nuutele: xi.1924, 1 ♀.

Tau, Manua: 27.ix.1923, 2 ♂♂ (Swezey and Wilder).

Tonga Islands: Vavau, Neiafu, 9.iii.1925, 1 ♂; 1.iii.1925, 1 ♂. Nukualofa, 14.ii.1925, 1 ♂; 24.ii.1925, 1 ♀. Total: sixty-five examples.

In the collection of the British Museum there is a very large series of this species showing a wide distribution, from the Malay Archipelago to China and Japan in one direction, and to Australia in the other.

11. *Aulacophora quadrimaculata* Fabricius.

Crioceris quadrimaculata Fabricius, *Sp. Ins.*, i, p. 152, 1781.

Fabricius described this species in the work cited above from two specimens in the Banksian Collection, which is preserved in the British Museum (Natural History). The specimens in question are stated by Fabricius to have been obtained by Dr. Forster at the Cape of Good Hope, which is probably incorrect; but the statement at least shows that the insects were collected in a distant foreign land, and not in Europe. In *Ent. Syst.*, i (2), p. 12, 1792, Fabricius bestowed the name *Crioceris quadrimaculata* upon a second species, stated to have been found in Southern Germany. This latter species, the type of which is in the Lund Collection, in all probability is in no way related to the *Crioceris quadrimaculata* in the Banks Collection. At any rate, whatever may be the insect in the Lund Collection, the name given to it is not valid and need not concern us here.

Among those beetles occurring in Oceania and the adjacent regions with the type of pattern consisting of two large black patches on each elytron, one of the means by which species may be differentiated is afforded by a secondary

sexual character of the male. In some species in the male the basal segments of the antennae are dilated, while in others this dilatation is absent. The particular nature of the dilatation has also been pressed into service to separate species among those that have males with dilated basal segments. It may be remarked that species in which the basal segments are not dilated in the male nevertheless have these segments somewhat thicker in the male than in the female. The black patches on the elytra, on the head and on the under side of the body are variable within a species, and transitional forms exist, but these markings have been used in separating species.

It is quite probable that *Galleruca austrocaledonica* Montrouzier, *Ann. Soc. Ent. Fr.* (4), i, p. 299, 1861, and *Aulacophora tetrastictoptera* Lea, *Mem. Queensland Mus.*, viii, 1, pp. 50-1, 1924 (cotypes in the British Museum) are identical with *A. (Crioceris) quadrimaculata* F.; but the question can never be definitely settled because the Fabrician type in the Banks Cabinet is a female, and it is impossible to ascertain whether the males of the Fabrician species have the basal segments of the antennae dilated or not. Moreover, the female of the Fabrician species agrees closely with the females of several other species, whether the males of the latter have dilated segments in their antennae or not. The difficulties that have arisen here cannot be settled by the comparison of structural characters.

In these circumstances I propose to call the Samoan species by the oldest name given to this type of insect occurring in the regions under study, and I suggest that experimental breeding be undertaken by those who have the opportunity, in order to ascertain whether we are dealing with a single species with dimorphic males.

Variation in the Samoan Specimens.

1. The males are somewhat smaller, and have the basal segments of the antennae simple, *i.e.* not dilated.

2. The postocular black patches vary in size; in one or two cases they have become larger, and have coalesced in the interocular space.

3. The elytral patches also vary in size; their boundaries are sometimes well defined, sometimes irregular. Among the examples from Savaii, the posterior elytral patch is enlarged and sends off extensions to meet the anterior patch. It is possible to conceive a case in which the whole elytral surface might become black owing to the enlargement and confluence of the four elytral spots.

Geographical Distribution.

Aulacophora tetrastictoptera Lea (considered as synonymous with the Fabrician species) has been taken in the following localities:—Australia: Northern Territory (Blackburn's Collection), Darwin (W. K. Hunt), Roper River (N. B. Tindale); Queensland, Cairns district (Blackburn's Collection). New Guinea: St. Joseph's River (Sir Wm. MacGregor).

Aulacophora austrocaledonica Montrouzier (also considered as synonymous with the Fabrician species) was collected in New Caledonia.

In the collection of the British Museum other examples resembling the Fabrician species are labelled as follows: Fiji Islands, Ovalau; Nova Holland (De Boulay); N. Australia, Cape York Pen., Cowal Creek, 15.viii.1924 (G. H. Wilkins); N. T. Australia, Groote Eylandt, 27.ii.1925 (G. H. Wilkins).

In the material under discussion the following specimens were found:

Upolu: Aleipata, iv.1924, 1 example. Siumu, 26.xi.1923, 1 example (Armstrong). Apia, 29.viii.1924, 1 example.

Manua: Tau, 20.ii.1926, 1 example (Judd); 27.ix.1923, 1 example (Swezey and Wilder).

Savaii: Fagamalo, xi.1925, 1 example. Salailua, 19.v.1924, 3 examples (Bryan).

Tutuila: Pago Pago, 14.xii.1925, 2 examples; 18.iv.1924, 1 example (Bryan); 9.ix.1923, 5 examples; 10.ix.1923, 1 example; 18.ix.1923, 1 example; 30.ix.1923, 1 example (all these collected by Swezey and Wilder); 3,000 ft. iv.1918, 1 example (Kellers). Fagasa, 9.ix.1923, 1 example. Amouli, 5.ix.1923, 1 example (Swezey and Wilder). Leone Road, 19.ii.1924, 1 example (Bryan). Total: twenty-four examples.

12. *Aulacophora nigrobrunnea*, sp. nov. (Text-fig. 9).

Body oblong, somewhat broadened behind. Elytra black; antennae, prothorax, scutellum and under side brown, sometimes darker or piceous.

Head somewhat exerted; vertex sometimes with a few punctures and always finely reticulate; interocular space with a deep transverse impression, crossed by a deep median longitudinal impression; interantennal space with a ridge, continued to the labrum; eyes strongly convex; antennae hairy, long, slender, extending slightly beyond middle of elytra, first segment long and

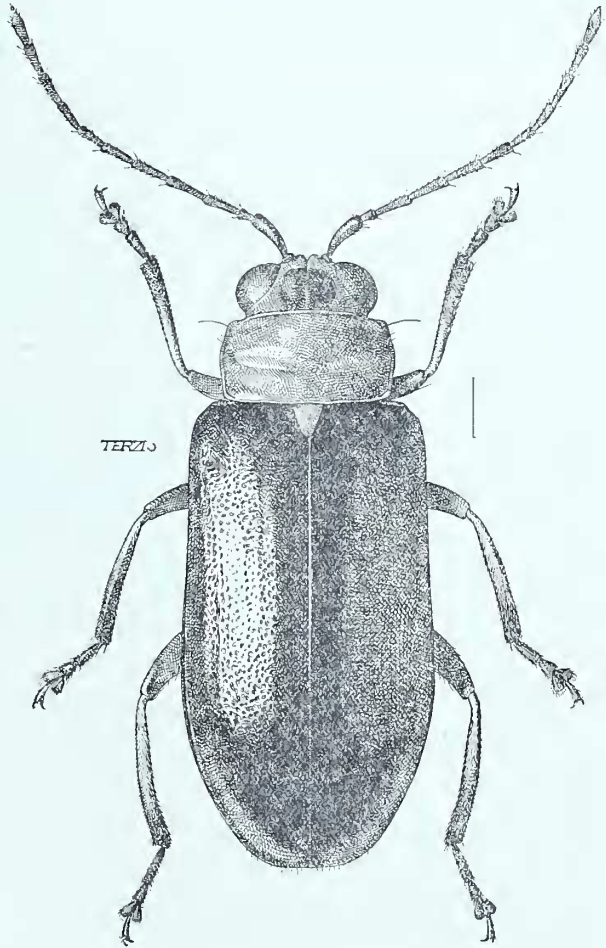
club-shaped, second small, about one-third as long as first, third, fourth, and fifth segments about equal, in some specimens third segment, in others fourth appearing to be somewhat longer; sixth and following segments somewhat shorter and about equal to each other. *Prothorax* rectangular, broader than long, each corner with a fine seta; at anterior angles sides somewhat incurved; lateral margins slightly reflexed; upper surface sparsely and finely punctate; postmedian transverse depression varying in depth and sometimes interrupted in the middle. *Scutellum* triangular with rounded apex; surface somewhat convex and very finely shagreened. *Elytra* broader at base than prothorax; humerus prominent; entire surface finely shagreened and also fairly strongly punctate, not smooth, but with ill-defined longitudinal ribs. *Under side* covered with fine hairs; tibiae with a sharp spine at apex; claws bifid.

Length, $7\frac{1}{2}$ mm.; *breadth*, $3\frac{1}{2}$ mm.

Upolu: Malololelei, 2,000 ft., 25.ii.1924, 1 example; 14-30.vi.1924, 2 examples (including the type). Vailima, 16.v.1924, 1 example.

Tutuila: 1,200 ft., xii.1918, 1 example (Kellers). Centre of island, 900-1,200 ft., 30.vi.1918, 1 example (Kellers). Leone Road, 19.ii.1924, 1 example (Bryan). Pago Pago, 10.ix.1923, 1 example (Swezey and Wilder).

Savaii: Safune, rain forest, 2,000-4,000 ft., 23.v.1924, 2 examples (Bryan).



TEXT-FIG. 9.—*Aulacophora nigrobrunnea*, sp. n. $\times 10$.

Another example before me has "Samoa" on the locality label, and also bears a label with the word "Orthaulaca" on it in Weise's handwriting.

Type in the British Museum.

Described from eleven examples.

The coarser punctuation and general rough sculpturing of the elytra distinguish this species from all other similarly coloured ones known to me.

Plesistia, gen. nov.

Body subcylindrical, oblong, with rounded apex; subopaque, head and pronotum apparently somewhat more shining. Antennae extending to about middle of elytra, first and fourth segments long. *Prothorax* a little more than twice as broad as long, with rounded sides; the anterior and posterior lateral angles are rounded right angles, each bearing a fine seta; upper surface uneven with smooth shallow depressions, very sparsely punctate. *Scutellum* pubescent. *Elytra* parallel-sided, and each with ten ribs including a short scutellar one, suture raised; each alternate rib more strongly raised than the others, so that there are four strong and five weak ribs on each elytron; scutellar rib weak; intervals between ribs irregularly punctate. *Under side* hairy; anterior coxal cavities completely closed behind (see Text-fig. 10); legs strong, upper surface of tibia with a fine rib, under side rounded, and apex without a spine. Claws strong, with an angulate projection at base on under side (see Text-fig. 11a).

Genotype: *Plesistia brunnea* Maulik.

Range: Samoa.

Relationship.—The new genus described above is related to *Pleronexis* Weise (*Nova Guinea*, v, *Zool.*, p. 321, 1908) in that both possess ribs on the elytra and hairs on the scutellum. In *Plesistia* the anterior coxal cavities are closed behind (see Text-fig. 10), while according to Weise they are open in *Pleronexis*. Through the courtesy of Dr. J. B. Corporaal, however, I have had the opportunity of examining Weise's type, and I find that the anterior coxal cavities are not open behind. The closure of the coxal cavities in *Pleronexis* is of the same type as in *Plesistia*. The difference between the two genera lies in the fact that in *Pleronexis* all the ribs on the elytra are equally raised, while in *Plesistia* a strongly raised rib alternates with a less elevated one. As regards geographical distribution the two genera are alike.

13. *Plesistia brunnea*, sp. nov. (Text-figs. 10 and 11).

General colour grey-brown; in some specimens brown colour more prominent, grey colour being more conspicuous on pronotum and head; elytra sometimes speckled with red spots; vertex of head black, generally concealed by pronotum. Eight apical segments of antennae blackish on upper, brownish on under side, first three segments and basal part of fourth brown. On under side, portions of metathorax and the abdominal sternites blackish, tarsi and apices of tibiae piceous.

Head large, somewhat exserted, impunctate, vertex with median longitudinal impressed line which is continued along interantennal space to base of labrum; base of antennae situate in an excavated area. First segment of antennae long and club-shaped, second much shorter than third, latter shorter than either first or fourth, which is the longest; fifth and following segments

TEXT-FIG. 10.—Coxal cavities of *Plesistia brunnea*.

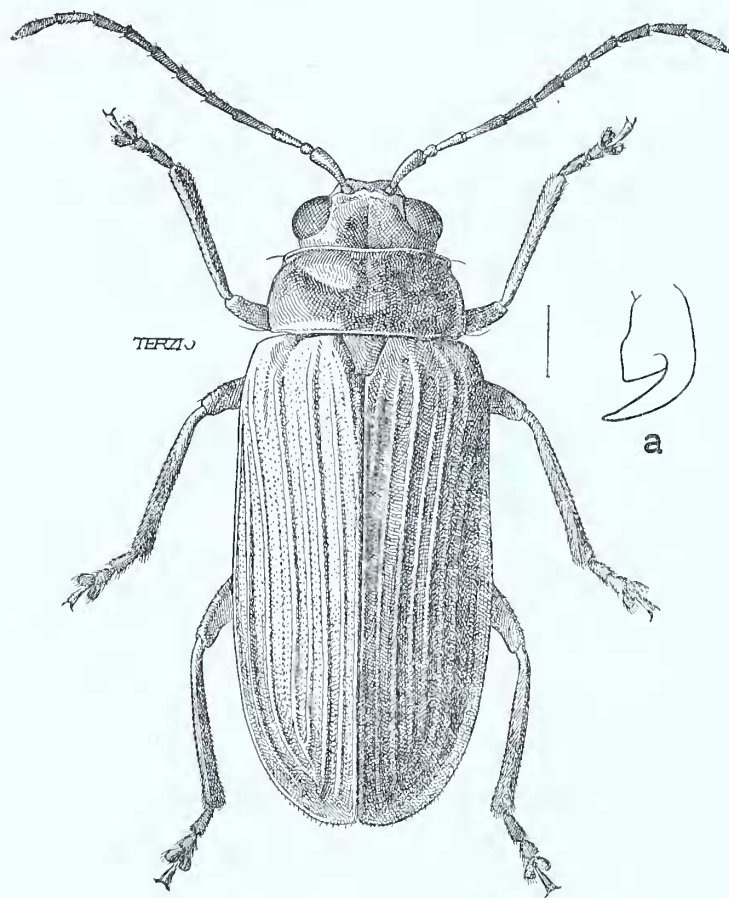
about equal and more hairy, last segment bluntly pointed. *Prothorax* with upper surface having a somewhat flattened appearance, with a shallow depression anteriorly on each side of middle longitudinal line. (The general unevenness of the surface can be more easily detected if the insect is examined from different angles.) *Scutellum* triangular, with broadly rounded apex and hairy surface. *Elytra* slightly broader at base than prothorax; each elytron with ten ribs including a short scutellar one, but excluding suture, which is also raised like a rib; short scutellar rib anastomosing with suture; rib next suture weak, alternate ribs more strongly raised; between lateral margin and next strong rib is a wide space, which contains last weak rib and is closely and irregularly punctate; lateral margin very slightly explanate.

Length, 8 mm.

Upolu: Apia, v.1924, 1 example; v.1925, 1 example; 25.v.1924, 1 example; vii.1924, 4 examples (including the type); iii.1924, 1 example; ii.1924,

1 example; 11.v.1924, 1 example. Malololelei, 18.iv.1924, 1 example (Armstrong). Mulifanua, 9.xi.1925, 2 examples; 12.ix.1923, 1 example (Swezey and Wilder). Tafua volcano, 1917, 1 example (Swale); 27.v.1924, 1 example (Bryan).

Tutuila: 18.xii.1918, 3 examples; 1,100–1,200 ft., 18.iv.1918, 1 example



TEXT-FIG. 11.—*Plesistia brunnea*, sp. n. $\times 9$: a, claw.

(Kellers); eastern end of island, 1,070 ft., 21.vi.1918, 8 examples (Kellers). Pago Pago, 3,000 ft., 18.iv.1918, 4 examples. Amouli, 17.iii.1926, 1 example (Judd).

In the British Museum Collection there are two examples taken by Dr. H. Swale at Apia, 6.ix.1916, one of which is not a perfect specimen, while the other is smaller (7 mm.) and yellow in colour. In all probability these individuals

belong to the present species, but in default of further material the question cannot be definitely settled.

This species also occurs at Cuvu, Fiji Islands, whence there are three examples in the British Museum (10.x.1919, W. Greenwood).

Type in the British Museum ; paratypes in the Bishop Museum.

Described from thirty-eight examples.

HALTICINAE.

Nesohaltica, gen. nov.

Body oblong with apex of elytra rounded. *Head* broad, vertex delimited from interocular space by a deeply impressed transverse line ; raised areas in interocular space not strongly developed. Antennae eleven-segmented, with two basal and five apical segments thickened. Eyes convex, but not very strongly so and nowhere emarginate. *Prothorax* broader than long, with rounded sides, each corner with a pore bearing a fine seta ; anterior pores situated somewhat behind anterior angles so that latter appear truncate. *Elytra* confusedly punctate. *Under side* : anterior coxal cavities open behind ; intercoxal process of prosternum broad, concave, with its surface rough. Hind femur strongly dilated ; hind tibia with upper surface flat, not sulcate, and with short spine near apex beneath tarsus ; latter not more than half as long as tibia, first segment not longer than following segments together. Claws divaricate.

Genotype : *Nesohaltica nigra* Maulik.

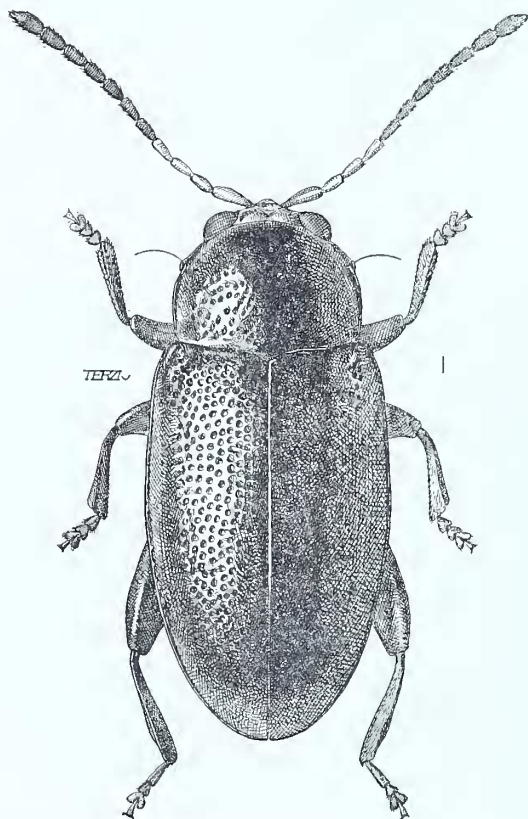
Range : Samoa.

14. *Nesohaltica nigra*, sp. nov. (Text-fig. 12).

General colour black tinged with blue, in some examples the black much diluted by pitch-brown ; tibiae and tarsi more pitch-brown ; five basal segments of antennae yellow-brown, remainder blackish or pitchy.

Head with vertex impunctate ; in interocular space near inner margin of each eye a round depressed spot ; a longitudinally impressed line dividing the moderately raised frontal areas. Antennae extending a little beyond middle of elytra ; first segment long and club-shaped ; second shorter, also club-shaped, about equal to third in length ; third, fourth and fifth segments more slender, about equal to each other in length ; sixth and seventh slightly thicker, equal

to each other; eighth, ninth and tenth segments thick, somewhat shorter; eleventh segment same thickness, longer and bluntly pointed. *Prothorax* with sides margined and rounded; upper surface uniformly convex and confusedly punctate, some of the punctures finer than others. *Scutellum* small, broader than long, triangular with apex broadly rounded, surface impunctate, finely shagreened. *Elytra* broader at base than prothorax, confusedly and strongly punctate; humerus raised, convex. *Under side* shining, with sparse, fine, whitish hairs; abdominal sternites finely and transversely striated. Other structures as described in generic diagnosis.



TEXT-FIG. 12.—*Nesohaltica nigra*, sp. n. $\times 30$.

Length, $2\frac{1}{2}$ mm.

Upolu: Mt. Vaea, 1,500 ft., 20.xii.1924, 1 example (type). Vailima, 24.vi.1924, 2 examples. Malololelei, 2,000 ft., vi.1924, 2 examples. Tuae fu, 16.ix.1923, 3 examples (Swezey and Wilder).

Tutuila: Pago Pago, 9.ix.1923, 1 example (Swezey and Wilder).

Savaii: Salailua, 21, 22.v.1924, 7 examples (Bryan).

Type in the British Museum.

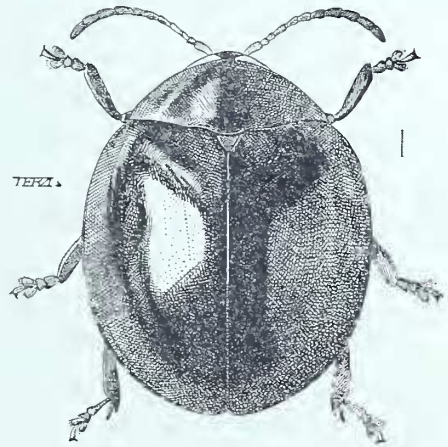
Described from sixteen examples.

15. *Sphaerophyma insularum*, sp. nov. (Text-fig. 13).

Body ovate, strongly convex. General colour shining black; antennae and tarsi of all legs light brown; parts of abdominal sternites darker brown, especially those that generally remain covered by the large posterior femora; portions of tibiae dark red-brown (especially when seen by transmitted light).

Head in repose deeply retracted within prothorax; interocular space slightly convex, more so above roots of antennae, and with two round punctures, one on

each side close to eye-margin and each bearing a fine seta ; clypeus sharply triangular, somewhat raised, with a sharp median longitudinal ridge, and a few long scattered setae. Eyes large, occupying a large portion of the head, though not so closely approximate as in the genus *Paradibolia*. Antennae eleven-segmented, extending a little beyond humerus, slightly thickened towards apex, three basal segments almost without hairs, remainder more hairy ; first segment longest and club-shaped, second small and ovate, third slender somewhat longer than second ; fourth and following segments thickened ; fourth and fifth segments equal, each somewhat longer than any of the remaining segments, which are about equal to one another, terminal segment bluntly pointed. *Prothorax* transverse, longest in centre ; basal margin bisinuate on each side, and lobed in middle ; sides margined and oblique ; upper surface convex, sloping on each side, very minutely and confusedly punctate, punctures not close together ; each of the four corners with a raised pore for reception of a seta. *Scutellum* small, triangular, impunctate. *Elytra* hardly broader at base than prothorax, very minutely and not very closely punctate ; on a background of confused punctures ten regular rows, including a short scutellar row, recognisable on each elytron ; these rows not at regular intervals, two pairs on lateral area closer to each other than those on discal area ; between last row and elytral lateral margin a wide space of confused punctures ; regularity of the rows not well maintained on apical area, where punctures become more obsolescent, while on basal area rows are more evident. *Under side* : abdominal sternites minutely punctate and sparsely covered with whitish hairs ; owing to enormous size of posterior femora, which generally remain pressed against abdomen, sternites appear somewhat concave. Elytral epipleurae broad, vertical. Anterior coxal cavities open behind ; intercoxal process of prosternum broad, with surface rough, punctate and margined on each side ; in repose, prosternal process closely opposed to mesasternal process, which is of same width. First abdominal sternite with a median, longitudinal, well-defined oval area. Posterior femora



TEXT-FIG. 13.—*Sphaerophyma insularum*,
sp. n. $\times 14$.

strongly dilated ; posterior tibiae short, fitting closely into inner surface of corresponding femora ; tibia (Text-fig. 15*k*) gradually broadening towards apex, which is drawn out into a point, its surface being somewhat convex proximally, and somewhat concave at broadest part ; tarsus arising from a point on concave surface distant from apex ; tibial spur greatly enlarged so as to form a thick club-shaped process, surface of which appears ridged ; lateral margins of process sinuous, outer margin more so than inner ; tarsus almost as long as tibia ; claws appendiculate.

Length, $3\frac{1}{4}$ mm., greatest width, $2\frac{1}{2}$ mm.

Tutuila : Pago Pago, 30.ix.1923, 1 example (type) (Swezey and Wilder).
Leone Road, 7.ix.1923, 1 example (Swezey and Wilder).

Type in the British Museum ; paratype in the Bishop Museum.

Described from two examples.

It will be noticed that the form of the hind tibia (*cf. j, k*, Text-fig. 15) in the genotype of *Sphaerophyma* differs from that in the present species, but the tibial processes in both cases are similar in form and structure, *i.e.* in the possession of ridges on the surface. In other structures considered collectively *S. insularum* resembles the genotype, and I therefore consider the difference in the form of the hind tibia as specific ; examination of further material may alter this view.

In determining the relationship of this species it was found necessary to make a comparative study of the structure of the posterior legs of insects belonging to the genera dealt with below. In these the insects show special modifications of the hind tibiae, which possess taxonomic value. As a result of the study the following general statements have been framed and the characters analytically shown in a table, accompanied by illustrations.

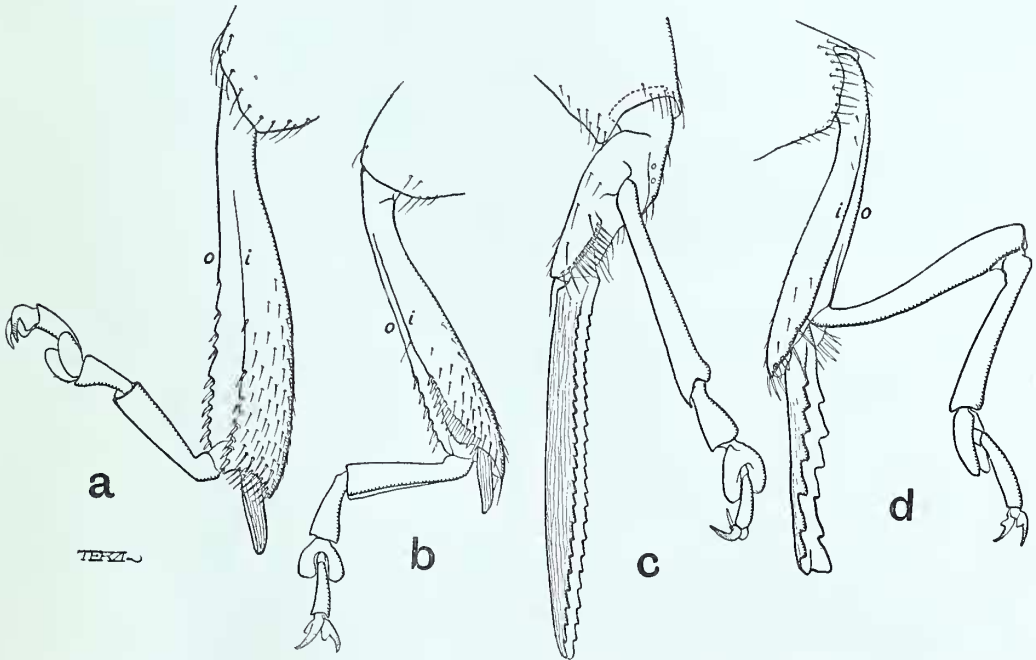
(1) The posterior femur is enormously dilated, and is held pressed against the abdomen, where a depression has been developed on the ventral surface. The outer edge of the femur is broadly rounded, and the inner has a slight concavity for the reception of the corresponding tibia.

(2) The tibia is always short, never exceeding the length of the inner side of the femur. It is narrow and cylindrical near the point of articulation with the femur, whence it gradually broadens towards the apex. It is a solid structure, having an upper and a lower surface, and two lateral margins, that nearer the body being termed the inner and the other the outer margin. The upper surface is flat, or somewhat convex, and without hairs, while the lower is semicylindrical, often with a clothing of hairs, more especially near the tip. The lateral margins

are generally straight near the base, and sometimes continue so to the end, but they are often undulate, dentate, serrate or setate. The extreme end of the tibia is rounded, or produced in various ways.

(3) At the broad-end apex of the tibia the upper surface is concave or sometimes slightly so, and in the concavity is articulated the tarsus, immediately beneath which is the process or spur.

(4) The tarsus is almost as long as the tibia, or sometimes longer. Of the four tarsal segments, the first is the longest, and often as long as the remaining

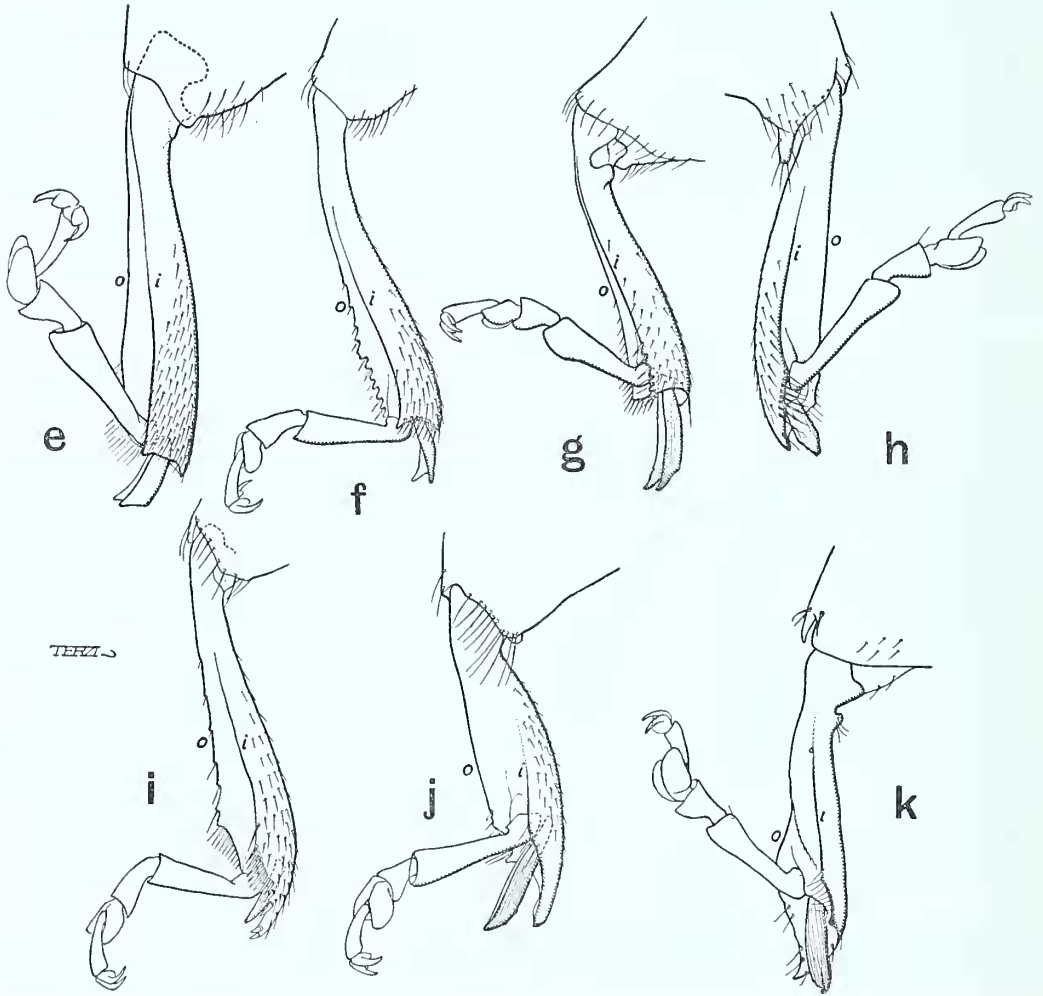


TEXT-FIG. 14.—Hind tibiae of:—(a) *Diboloides bicolor*; (b) *Dibolosoma quadripustulata*; (c) *Aphthonoides* sp.; (d) *Serraphula aenea*. *i* indicates inner, *o* outer margin of tibia.

segments together; the second is always short; the third is bilobed; the fourth is long, and, arising from the base of the bilobed segment, projects much beyond it; at its apex it bears a pair of claws. A claw may be simple or may have an angular projection underneath at the base, in which case it is called appendiculate.

(5) The tibial process or spur varies in length; it has the shape of a rod or club, with its apex rounded, emarginate, split or pointed. Its surface may be plane, or may have the appearance of being ridged. In some cases the process

is longer than the tibia, and very narrowly channelled on the upper surface, with the edges uniformly serrate.



TEXT-FIG. 15.—Hind tibiae of:—(e) *Paradibolia indica*; (f) *Dibolia occultans*; (g) *Megistops quadrinotatus*; (h) *Argopistes biplagiata*; (i) *Pseudodibolia picea*; (j) *Sphaerophyma simoni*; (k) *Sphaerophyma insularum*. Figures h, i, and j are of left legs, the others of right legs. i indicates the inner margin, o the outer.

The above observations are drawn from the following species :

(1) *Diboloides bicolor* Jacoby, *Proc. Zool. Soc. Lond.*, p. 553, 1897. S. Africa : Mashonaland (Text-fig. 14a).

(2) *Dibolosoma quadripustulata* Jacoby, *ibid.*, p. 560, 1897. Madagascar (Text-fig. 14b).

- (3) *Aphthonoides* * Jacoby, *Ann. Mus. Civ. Genova*, xxii, p. 59, 1885. Java, Sumatra, Japan (Text-fig. 14c).
- (4) *Serraphula aenea* Jacoby, *Proc. Zool. Soc. Lond.*, 1897, p. 557, 1897. S. Africa : Mashonaland (Text-fig. 14d).
- (5) *Paradibolia indica* Baly, *Trans. Ent. Soc. Lond.*, p. 31. 1875. India (Text-fig. 15e).
- (6) *Dibolia schillingi* Letzner, *Übers. Verh. Schles. Ges.*, 1846, p. 82, 1847. Europe.
- (7) *Dibolia occultans* † Koch, *Ent. Heft.*, ii, p. 23, 1803 ; Latreille in Cuvier *Règn. Anim.*, n. ed., v, p. 155, 1829. Europe (Text-fig. 15f).
- (8) *Megistops quadrinotatus* Boheman, *Eugenies Resa, Insecta*, p. 187, 1859. California (Text-fig. 15g).
- (9) *Argopistes biplagiata* Motschulsky, in Schrenck's *Reisen Amur-Land*, ii, Lief 2, Col., p. 236, 1860. Amurland ; Japan (Text-fig. 15h).
- (10) *Pseudodibolia picea* Jacoby, *Biol. Centr.-Amer., Col.*, vi (1), Suppl., p. 291, 1891. Mexico (Text-fig. 15i).
- (11) *Sphaerophyma simoni* Baly, *Jour. Linn. Soc. Lond.*, xiii, p. 479, 1878. Queensland : Rockhampton (Text-fig. 15j).
- (12) *Sphaerophyma insularum* Maulik. Samoa (Text-fig. 15k).

ANALYTICAL TABLE.

- | | |
|--|---|
| 1. Anterior coxal cavities closed behind . . . | 2. |
| Anterior coxal cavities open behind . . . | 3. |
| 2. Tibia longer than tarsus ; extreme apex of | |
| tibia rounded, emarginate on each side ; | |
| inner lateral edge without serration except | |
| towards apex, outer lateral edge serrate ; | |
| process a slightly curved rod with blunt | |
| apex, much shorter than first tarsal seg- | |
| ment ; claws strongly appendiculate . . . | <i>Diboloides</i> Jacoby (Text-fig. 14a). |

* The preparation was made of a leg from a Japanese specimen collected by G. Lewis, which was known to Jacoby and no doubt belongs to this genus.

† Latreille in erecting the genus *Dibolia* cited two species, namely, *Altica (Haltica) echii* and *A. (H.) occultans*. Since the former belongs to the genus *Longitarsus*, the latter is designated as the genotype of *Dibolia*. The earliest descriptions of these species occur in *Entomologische Hefte*, ii, pp. 52 and 23, 1803. The authorship should be ascribed to four people whose names appear at the end of the preface to *Entomologische Hefte*, Heft i, without any indication as to who was actually the writer of the descriptions. These names are Hoffmann, Koch, Müller, and Linz.

In *Magaz. f. Insektenkunde*, vi, p. 50, 1807, however, Illiger states that Koch was responsible for the descriptions of the species in *Ent. Heft.*, at least certainly those of the *Halticinae*.

- Tibia as long as tarsus ; lateral edges of tibia
bristly towards apex, outer edge serrate
near apex ; process a small, plain, pointed
rod, much shorter than the first tarsal
segment *Dibolosoma* Jacoby (Text-fig. 14b).
3. Tibial process extraordinarily long and shaped
like a saw 4.
Tibial process not so long and not saw-like 5.
4. Process about thrice as long as tibia, which is
much abbreviated ; upper surface of pro-
cess very narrowly concave, with both
lateral edges uniformly and finely serrate ;
apex somewhat flattened ; tarsus as long
as process, first segment longer than
following three segments together, second
segment very small, somewhat broad,
bilobed segment with slender lobes, claw-
segment somewhat thickened ; points of
origin of process and tarsus not near
together, process arising from apex of
tibia, and tarsus from near base of latter ;
tibia accordingly modified *Aphthonoides* * Jacoby (Text-fig. 14c).
- Tibia somewhat longer than either process or
first tarsal segment, which are about equal
in length ; extreme apex of tibia rounded ;
lateral edges plain, without teeth, serra-
tions or bristles, except a few at tip ; pro-
cess with upper surface concave and lateral
edges toothed ; second segment of tarsus
long, but somewhat shorter than first ;
lobes of bilobed segment slender ; claw-
segment long *Serraphula* Jacoby (Text-fig. 14d).
5. Extreme apex of hind tibia not distinctly
produced 6.
Extreme apex of hind tibia distinctly pro-
duced 8.
6. Tibial process deeply cleft at apex 7.
Tibial process emarginate at apex ; process
broad, about half as long as first tarsal
segment ; lateral edges of tibia without
serrations or teeth, outer edge undulate at
apex *Paradibolia* Jacoby (Text-fig. 15e).

* Jacoby's original account (*loc. cit.*) of the tibial characters does not agree with the present description, which is taken from an example seen by him. It may be remarked that the relative arrangement of tibia, tarsus, and spur, as seen in this genus, differs from that found in other genera studied here.

7. Tibial process comparatively broad, with its upper surface somewhat concave, and its length more than half that of first tarsal segment; tibia with inner margin without teeth,* and outer margin with teeth for about half its length *Dibolia* Jacoby (Text-fig. 15f).
 Tibial process very deeply cleft, slightly shorter than first tarsal segment; lateral edges with very minute serrations and bristles only near apex *Megistops* Boheman (Text-fig. 15g).
 8. Femur with ventrally situated blunt process; tibial process very small, with bluntly pointed apex; apex of tibia acuminate; lateral edges without serrations *Argopistes* Motschulsky (Text-fig. 15h).
 Femur without such process 9.
 9. Apex of tibia narrowly produced into a spatulate process; outer lateral edge of tibia with serrations and emarginations, and with strong bristles near apex; tibial spur small and pointed *Pseudodibolia* Jacoby (Text-fig. 15i).
 Tibia comparatively short, broad, and produced into a point at apex; tibial process large, slightly shorter than first tarsal segment, bluntly pointed, with surface ridged; lateral edges of tibia with wide emargination near apex. *Sphaerophyma* Baly (Text-figs. 15j, k, and 16).

In his generic diagnosis Baly writes: "Acetabulis anticis integris." I have, however, examined the genotype in the British Museum, and find that the



TEXT-FIG. 16.—Anterior coxal cavities of *Sphaerophyma simoni*.

anterior coxal cavities are quite open behind; in fact, so widely are they open that there cannot possibly be any doubt on the subject (cf. Text-fig. 16).

* This is in a preparation of *D. occultans*, but in a preparation of *D. schillingi* a few teeth are visible on the inner margin at the apex.

In the case of each genus, with the exception of *Megistops*, *Dibolia* and *Argopistes*, I have examined the genotype. With regard to *Megistops* and *Dibolia* I have examined specimens determined by Baly, and have accepted Ogloblin's determination of *Argopistes biplagiata* Motschulsky. The genus *Argopistoides* Jacoby (*Ann. Mus. Civ. Genova*, xxxii, p. 931, 1892) should have been included in the present study, but I have no means of examining the genotype, in which, according to Jacoby, the posterior tibia is deeply sulcate in the apical portion and armed with a robust double-pointed spur.

This study of the tibial characters is not exhaustive, but sufficient to show beyond doubt the relationship of the Samoan species, and incidentally it indicates a line of research which could be pursued in order to show the variety of structure in correlation with the jumping habit of Halticinae.

In the above table the characters presented by the hind tibia and tarsus, etc., are stated in a comparative manner, and, by means of them alone, it is not intended here to establish relationships among the genera dealt with.

HISPINAE.

16. *Promecotheca reichei* Baly.

Promecotheca reichei Baly, *Trans. Ent. Soc. Lond.*, p. 374, 1869.

Promecotheca lindingeri Aulmann, *Entom. Rundschau*, xxxi, pp. 27, 28, 1914.

Upolu: Mulifanua, 16.vii.1925, 5 examples; 17.vii.1925, 2 examples (Wilder).

Tutuila: Pago Pago, 3,000 ft., iv.1918, 1 example (Kellers); 1,000 ft., 1 example (Kellers).

[During 1924, 1925, we looked carefully for this species in many parts of Samoa; the only specimens we found were on a coconut-palm at Mulifanua, Upolu, in November, 1925. This is remarkable, since Aulmann has recorded it as a pest, though he gave no details.—P. A. B.]

It may be recorded here that an example from the Deutsches Entomologisches Museum, Berlin, sent to me by Dr. Walther Horn, is from Savaii. Although the specimen is not perfect, I do not hesitate to identify it as *P. reichei* Baly. Specimens are known from Tonga, Fiji, and elsewhere.

Distribution of the Genus.—The genus *Promecotheca*, first described in 1853, by Blanchard, from a specimen taken in Tonga, has representative species in Fiji, New Hebrides, Solomon Is., New Pomerania, New Guinea, North Australia,

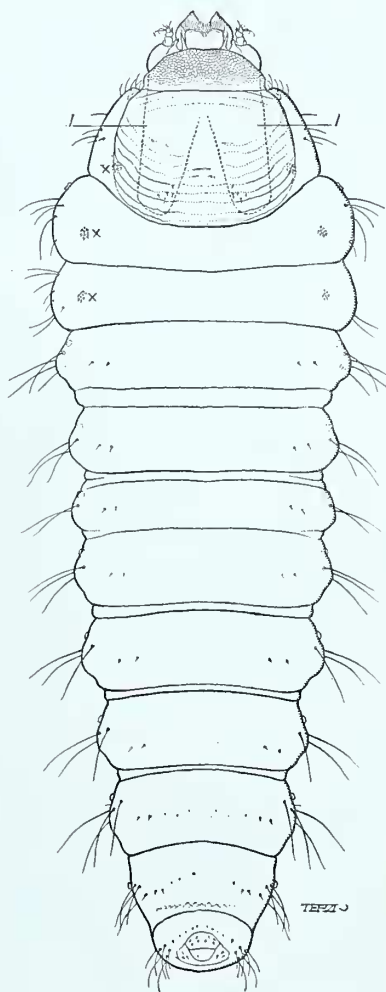
Borneo, Java, the Philippine Is., and China. The distribution of the species of this genus, so far as the food plants are known, depends on that of the coconut-palm, upon which these insects feed, the larvae living in the folds of the unopened tender leaf-buds. It is to be expected that species of *Promecothea* will be found to occur wherever the coconut-palm is cultivated.

DESCRIPTION OF THE LARVA OF *Promecothea reichei* BALY

(Text-figs. 17 and 18).

The following description is taken from a microscopical preparation of an example from the Fiji Islands, sent by Mr. H. W. Simmonds.

The larva (Text-fig. 17) is elongate, flattish, broadest across the mesothorax, and thence regularly diminishing in breadth, towards the posterior extremity, the last abdominal segment being the narrowest. It measures slightly less than 4 mm. when fully extended after treatment in potash. The body is composed of thirteen segments including the head; in addition to the three thoracic and nine abdominal segments, a fourteenth segment is represented by the anal sucker. The prothorax is narrowed in front, and has rounded sides. The mesothorax is much shorter than the prothorax; its sides are uniformly rounded without any lobes, and it is much broader than long. The metathorax is similar to the mesothorax. The abdominal segments are much broader than long; the sides of each of the first seven are somewhat produced so as to form a lobe; those of the eighth and ninth are less produced. On or near the lobes there are several fine bristles, which are most numerous in the case of the eighth and ninth segments. The upper and lower surfaces of the whole body are shagreened; those portions of the prothorax that are produced to the bases of



TEXT-FIG. 17.—Larva of *Promecothea reichei*, ventral view.

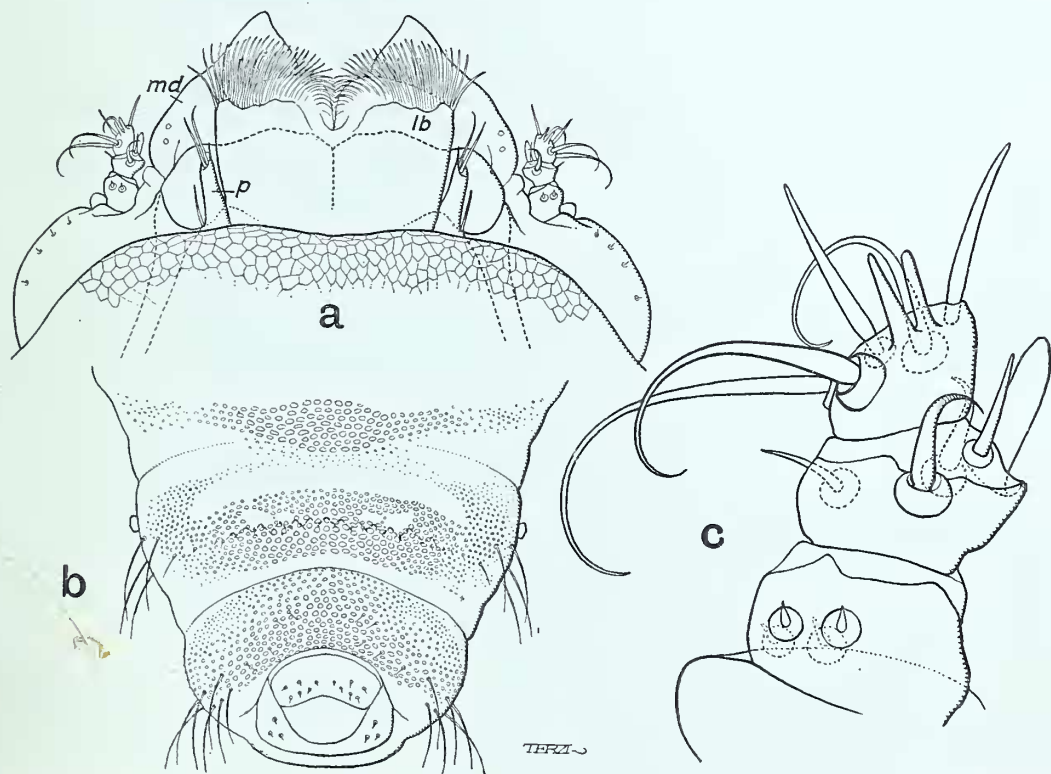
the labrum and labium have their surfaces very strongly reticulate; on the abdominal segments the central areas are more definitely shagreened, and this condition is much more conspicuous between the eighth and ninth segments (Text-fig. 18*b*). The shagreened surfaces no doubt facilitate the movements of the larva in its burrow. There are nine pairs of spiracles, of which one pair is on the mesothorax, each spiracle being situate anteriorly on one side and opening somewhat ventrally. The other eight pairs are on the first eight abdominal segments, each spiracle similarly occupying a lateral position but opening somewhat dorsally. In the present preparation all the spiracles can easily be traced by means of the portions of tracheae attached to them. The larva is devoid of legs, and I cannot trace any indication of rough or papilliferous surfaces at points where they should normally be found, unless the clusters of dots indicated by \times in Text-fig. 17 are to be considered as such.

Although the present specimen appears to be nearly full-fed, this is probably not the case; nevertheless the structural details are doubtless the same as in a full-fed larva.

Anatomy of the larval head (Text-figs. 17, 18*a*, *b*, *c*).

The head (Text-fig. 18*a*) is of the type usually found in larvae which are borers or leaf-miners. It is formed by a large chitinised plate, which is deeply divided into two elongate lobes and has the shape shown in Text-fig. 17 (*l*). There are strongly chitinised ridges acting as supports along the middle, and the whole head is imbedded in the prothorax except its anterior edge, each side of which is rounded, bearing an antenna, the middle portion being occupied by the mouth-parts. The buccal cavity is formed by labrum or upper membranous structure, the two mandibles and the labium or lower lip. The labrum is reinforced by a chitinous support along the middle; at its anterior edge and on the sides there are numerous papilliform bristles forming a brush-like structure. The mandible is triangular, its inner side being produced into a convex sharp edge without any teeth. The labium is membranous, deeply cleft in the middle and thus divided into two rounded lobes. Along the edge of each lobe there are numerous papilliform bristles. On each side of the labium a rather long and pointed palpus is visible. Situated on the upper edge of the exposed portion of the head and externally to the mandibles are the antennae. Each antenna is composed of three segments, a basal, a median and an apical; the basal seg-

ment is large ; on the inner side of the median segment is an erect, fairly thick lobe ; the third segment is situated a little to the outside of the longitudinal axis of the second, and bears seven papillae or hairs, as shown in Text-fig. 18c.



TEXT-FIG. 18.—Larva of *Promecotheca reichei*:—a, mouth parts, from below: *md*, mandible; *lb*, labium; *p*, labial palp. b, seventh, eighth, and ninth abdominal segments, from below. c, right antenna.

Triangular Structures (Text-fig. 18b).

In the present preparation a series of triangular structures is visible between the last two abdominal segments, appearing to lie between the dorsal and ventral surfaces of the body. In the absence of further material, there has been no opportunity of dissecting a larva, and thus throwing more light on the nature of these structures.

CASSIDINAE.

17. *Cassida strigula* Montrouzier.

Upolu : Apia, viii.1924, 5 examples. Aleipata, Lalomanu, xi.1924, 1 example. Siumu, 26.xi.1923, 1 example (Armstrong).

Tutuila : Eastern end of island, 1,070 ft., 21.vi.1918, 4 examples ; 1,000 ft., 25.viii.1918, 1 example ; 1,000–2,000 ft., xii.1918, 1 example ; 760–900 ft., iv.1918, 3 examples (Kellers). Fagassa, 9.ix.1923, 4 examples. Leone Road, 7.ix.1923, 1 example. Pago Pago, 24.ix.1923, 4 examples (Swezey and Wilder) ; 14.xii.1925, 1 example.

In the British Museum Collection there are two examples collected in Samoa between March and August, 1921, by Dr. F. W. O'Connor : one of these has been examined by Dr. F. Spaeth. There are others from N. Australia : Port Darwin, 2 examples ; Groote Eylandt, 27.i.1925, 1 example (G. H. Wilkins).

Mr. P. A. Buxton tells me that the Samoan specimens were found on sweet potatoes, and it is evident that the species has been introduced by commerce.*

In the *Coleopterorum Catalogus* (Junk and Schenkling, Berlin, 1914) *Cassida strigula* Montrouzier is treated by Spaeth as a subspecies of *C. diomma* Boisduval, which occurs in New Guinea. Herein Spaeth is quite possibly correct, especially in view of the great variation in the colour pattern of these beetles.

My reason for including this species in *Cassida* instead of in *Metriorina* is stated in my book, "Fauna of British India, Coleoptera, Chrysomelidae (Hispidinae and Cassidinae)," pp. 362–363, 1919.

* It is possible that the introduction took place centuries ago. Sweet potato ("Kumara") was used as food by the Polynesians before the white man entered the Pacific.—P. A. BUXTON.

LIST OF TEXT-FIGURES.

- Text-fig. 1. *Aprionota lucida*, sp. n. $\times 24$.
 „ 2. *Pycnophthalma tutuilana*, sp. n. $\times 30$.
 „ 3. *Stygnobia aenescens*, sp. n. $\times 11$.
 „ 4. *Stygnobia cauta* Weise. $\times 12$.
 „ 5. *Stygnobia variabilis*, sp. n. $\times 18$.
 „ 6. *Stygnobia minuta*, sp. n. $\times 26$.
 „ 7. *Stethotes rufonigra*, sp. n. $\times 22$.
 „ 8. *Plagiodera samoana*, sp. n. $\times 9$.
 „ 9. *Aulacophora nigrobrunnea*, sp. n. $\times 10$.
 „ 10. Coxal cavities of *Plesistia brunnea*.
 „ 11. *Plesistia brunnea*, sp. n. $\times 9$: *a*, claw.
 „ 12. *Nesohaltica nigra*, sp. n. $\times 30$.
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 „ 14. Hind tibiae of:—(a) *Diboloides bicolor*; (b) *Dibolosoma quadripustulata*; (c) *Aphthonoides* sp.; (d) *Scraphula aenea*. *i* indicates inner, *o* outer margin of tibia.
 „ 15. Hind tibiae of:—(e) *Paradibolia indica*; (f) *Dibolia occultans*; (g) *Megistops quadrinotatus*; (h) *Argopistes biplagiata*; (i) *Pseudodibolia picea*; (j) *Sphaerophyma simoni*; (k) *Sphaerophyma insularum*. Figures *h*, *i*, and *j* are of left legs, the others of right legs. *i* indicates the inner margin, *o* the outer.
 „ 16. Anterior coxal cavities of *Sphaerophyma simoni*.
 „ 17. Larva of *Promecotheca reichei* Baly, ventral view.
 „ 18. Larva of *Promecotheca reichei*:—*a*, mouth parts, from below: *md*, mandible; *lb*, labium; *p*, labial palp. *b*, seventh, eighth, and ninth abdominal segments, from below. *c*, right antenna.